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PESTS NOT KNOWN TO OCCUR IN THE UNITED STATES OR OF LIMITED
DISTRIBUTION, NO. 46: PINK-SPOTTED BOLLWORM

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Pest

PINK-SPOTTED BOLLWORM
Pectinophora scutigera (Holdaway)

Order: Family

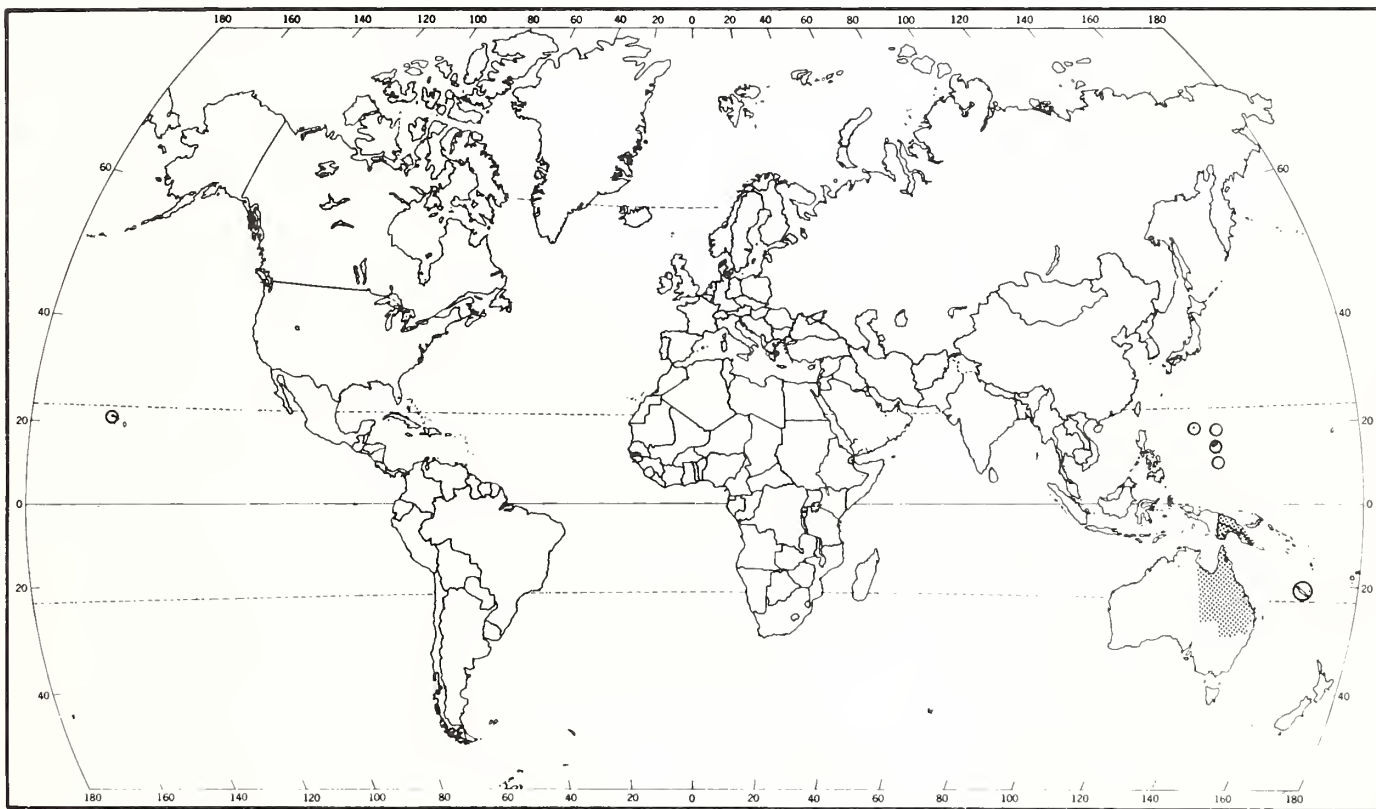
Lepidoptera: Gelechiidae

Economic
Importance

Larvae are a pest on cotton in Queensland, Australia. They feed
on seeds in the bolls. Infestation can be as high as 90 percent
of the bolls.

Hosts

Pectinophora scutigera feeds on Gossypium sp. (cotton),
Hibiscus divaricatus, H. tiliaceus (sea hibiscus), and
Thespesia populnea (portia tree), all in the Malvaceae
(Holdaway 1926).



Pectinophora scutigera distribution map prepared by
Non-Regional Administrative Operations Office and Biological
Assessment Support Staff, PPQ, APHIS, USDA

General
Distribution

Hawaii (Oahu), Australia (New South Wales, Queensland), Mariana Islands (Guam, Rota, Saipan, Tinian), New Caledonia, and Papua New Guinea (Ballard 1927, Chilson 1957, Dumbleton 1954, Holdaway 1929b, Oakley 1946, Sabine 1969a, Williams 1944).

Characters

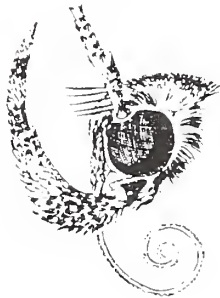
ADULTS - P. scutigera adults (Fig. 1) are inseparable from Pectinophora gossypiella (Saunders), pink bollworm, and from Pectinophora endema Common on markings, venation, or other aspects of habitus. Fresh specimens are dingy yellowish brown with 2 faint dark-brown spots in the cell. They can be recognized as Gelechiidae by the scaled haustellum; erect, sickle-shaped labial palpi; four-segmented maxillary palpi folded over base of haustellum; forewing without vein A1 (=CuP); and apex of hindwing somewhat produced. A well-developed pecten on the first segment of the antenna (Fig. 2)

(Fig. 1)



Pectinophora gossypiella adult, dorsal view (Courtesy D. C. Ferguson).

(Fig. 2)

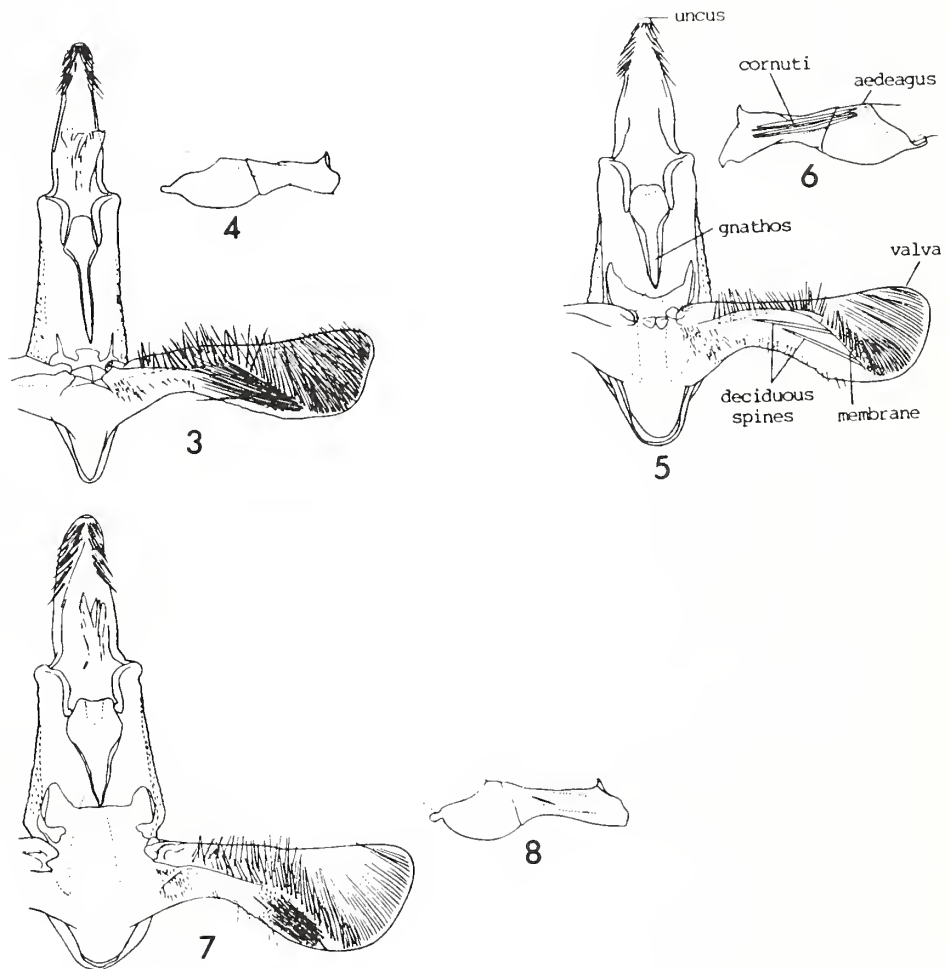


Pectinophora gossypiella head showing antennal pecten, lateral view (From Busck 1917).

signifies that the moth probably is a member of the pink bollworm group of moths and that the genitalia must be studied to ascertain generic or specific identity.

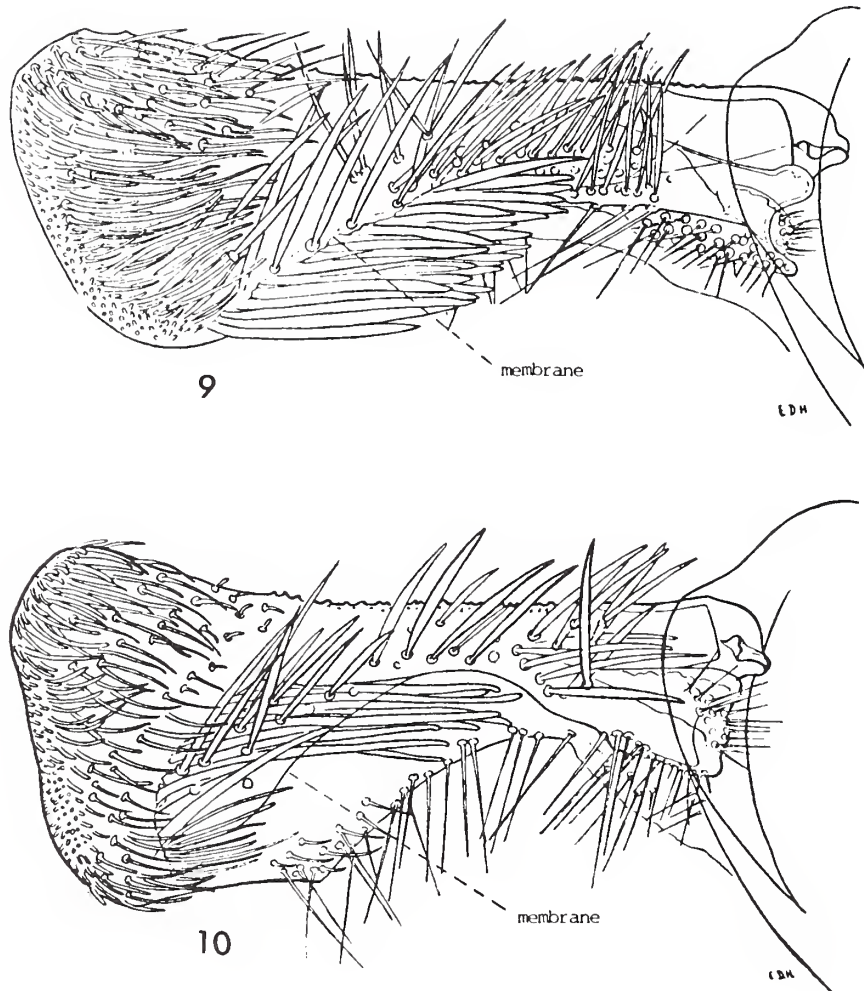
Males. Pectinophora have the uncus tapering to the apex and those of P. scutigera have a series of long, slender, deciduous spines that are exposed basally on the mesal surface of the valva (Figs. 3, 4, 9). P. gossypiella (Figs. 5, 6, 10) have long, stout, deciduous spines that are underneath a membrane basally; those of P. endema (Figs. 7, 8) have many short, slender, deciduous spines that are exposed basally.

(Figs. 3-8)



Pectinophora species, male genitalia. 3, 4 (lateral view), P. scutigera. 5, 6 (lateral view), P. gossypiella. 7, 8 (lateral view), P. endema (From Common 1958).

(Figs. 9-10)

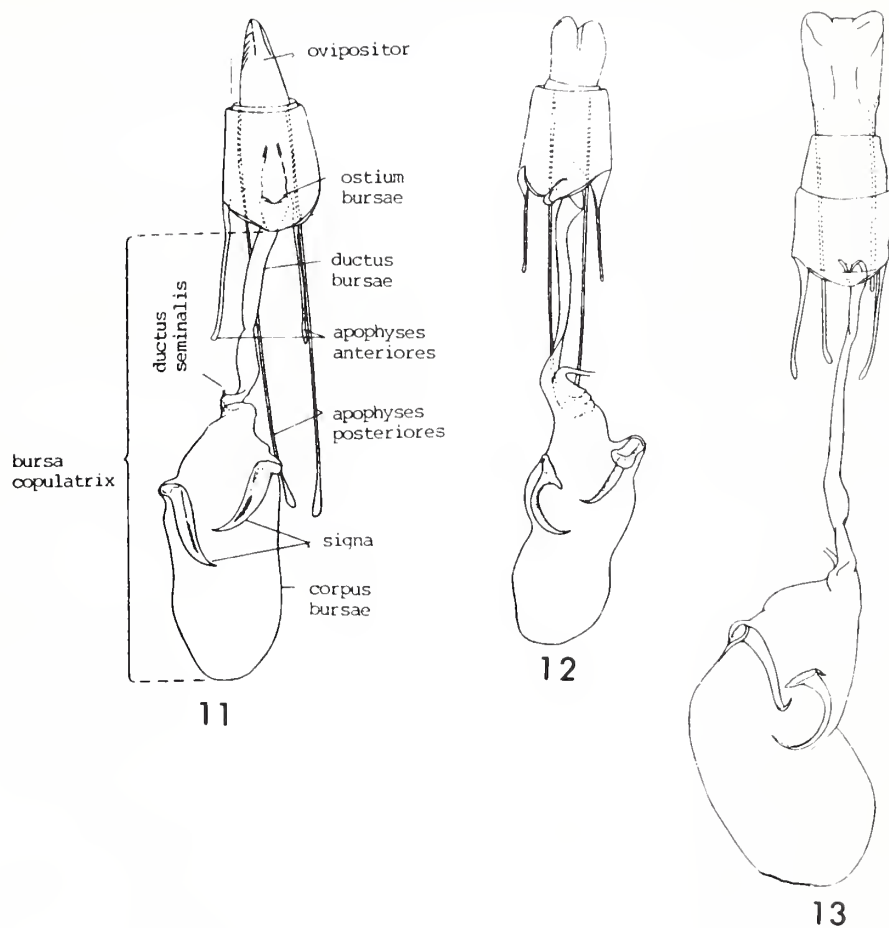


Pectinophora species, male genitalia, left valva, mesal view.
 9. P. scutigera, showing exposed, deciduous setae.
 10. P. gossypiella, showing deciduous setae arising beneath membrane (From Holdaway 1929a).

Females. Pectinophora have paired hooklike signa (Figs. 11, 12). Both P. scutigera (Fig. 12) and P. gossypiella (Fig. 11) have the apophyses posteriores longer than the ductus bursae; and P. scutigera (Fig. 12) has strongly curved, somewhat slender signa. P. gossypiella (Fig. 11) has stout, slightly curved signa. P. endema (Fig. 13) has the ductus bursae longer than the apophyses posteriores.

EGGS - Length 0.53-0.64 mm; width 0.30-0.33 mm. White to pale cream, becoming pink, blotched. Surface sculptured with longitudinal ridges joined by oblique lines.

(Figs. 11-13)



Pectinophora species, female genitalia, ventral views:
 11. P. gossypiella, 12. P. scutigera, 13. P. endema
 (From Common 1958).

LAST INSTAR LARVAE - Length 11-14 mm. Head capsule (Fig. 14) and prothoracic shield (Figs. 15, 16) dark brown, sometimes nearly black; preclypeus pale yellow; submentum and basal sclerites of maxilla off white; setae arising from dark-brown, heavily sclerotized pinnacula except on venter and ventro-lateral region; thoracic legs dark brown anteriorly at base, then white, tarsi light brown, claws brown; abdominal prolegs white, crochets uniordinal, arranged in 2 transverse bands; dorsal surface glassy white with pink blotches; ventral surface white.

Second through fourth instar larvae can be distinguished by the following key adapted from Capps (1958). The immature stages of P. endema are unknown.

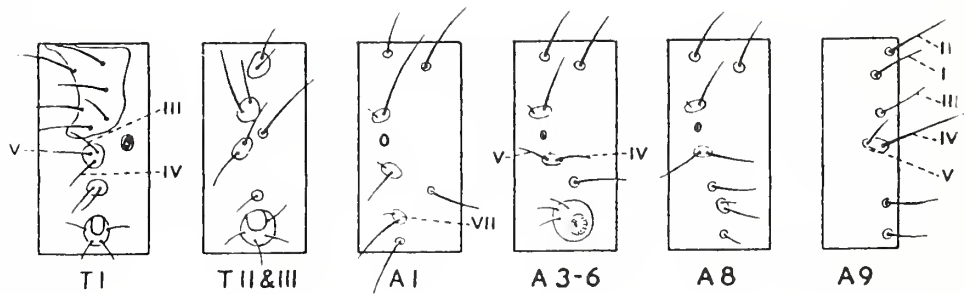
Identification Key to
Pink-spotted Bollworm and Pink Bollworm Larvae

1. Head (Fig. 14) with anterior puncture (Aa) between anterior setae A1 and A2 but closer to A2 than to A1. Prespiracular group of prothorax (Fig. 16) with 3 setae. First abdominal segment with only 2 setae in group vii. Abdominal proleg-bearing segments with seta iv approximate to seta v, much below level of spiracle; crochets uniordinal, arranged in a penellipse (Fig. 18) or 2 transverse bands (Fig. 19). Ninth abdominal segment (Fig. 16) with seta i approximately equidistant from setae ii and iii, and in line or nearly so; only 2 setae (iv and v) of lateral group present, seta vi absent. Anal segment without an anal fork
 (Pectinophora, Pexicopia, and Platyedra) - 2
- 1'. Not as above other species
2. Seta iii of ninth abdominal segment modified, weaker and more slender than seta i or ii Pexicopia, Platyedra
- 2'. Seta iii (Fig. 16) of ninth abdominal segment not modified, as strong as seta i or ii 3
3. Crochets on abdominal proleg-bearing segments arranged in 2 transverse bands (Fig. 19); on anal legs interrupted medially (Fig. 21) Pectinophora scutigera
- 3'. Crochets on abdominal proleg-bearing segments uniordinal and arranged in a penellipse (Fig. 18); on anal leg not interrupted medially, continuous (Fig. 20)
 Pectinophora gossypiella

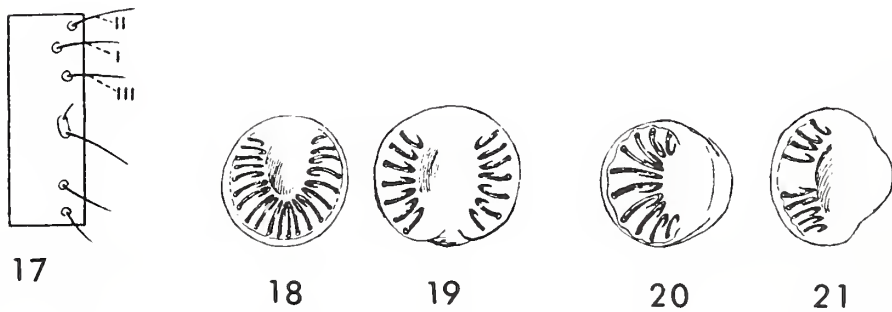
(Figs. 14-21.)



14



16



17

18

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21

Pectinophora and Platyedra species, larval characters:

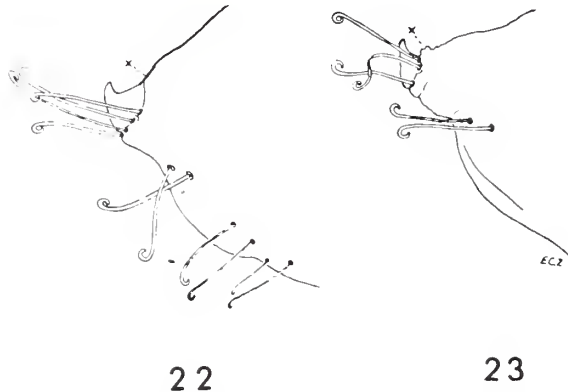
14. Platyedra vilella (Zeller) head capsule, anterodorsal view.

15. Numbering scheme for thoracic and abdominal segments.

16. Pectinophora gossypiella body setal chart. 17. Pectinophora scutigera ninth abdominal segment. 18-19. Crochets on abdominal segment: 18. P. gossypiella, 19. P. scutigera; 20-21. Crochets on anal proleg: 20. P. gossypiella, 21. P. scutigera (From Capps 1958).

PUPAE - Length 6.5-9.0 mm. Dark brown covered with short, red-brown setae (not easily visible in alcohol); apex of cremaster directed dorsally; 10 or 12 setae associated with cremaster. Pupa (Fig. 23) can be separated from that of P. gossypiella by a slight dorsal projection just before the cremaster; P. gossypiella (Fig. 22) lacks such a projection.

(Figs. 22-23)



Pectinophora species, apices of pupae: 22. P. gossypiella; 23. P. scutigera (From Zimmerman 1978).

Characteristic
Damage

Early instar larvae feed on the surface of cotton leaves, squares, flowers, bolls in all stages, terminal shoots, boll pedicels, and stems. Third and fourth instar larvae enter the bolls, where they may feed on different tissue but usually feed on the seeds within one or more carpels. Sabine (Personal communication 1984) has, however, noted that early instars frequently tunnel within carpel walls before feeding on developing seeds.

Detection
Notes

Movement of infested seed cotton, cotton bolls (green or mature), and other plant parts of this and its other hosts could introduce P. scutigera into new areas. Cotton which could be a possible source of infestation from areas where this pest occurs is enterable into the United States only under conditions specified in Title 7 of the Code of Federal Regulations. The conditions which would reduce the pest risk in foreign cotton for nonpropagative purposes are specified under Part 319.8. Plants or plant parts of Gossypium spp. intended for propagation are prohibited from all sources because of other pests (except for scientific purposes under USDA permit) under Parts 319.37 and 318.47. Propagative material of Hibiscus spp. from foreign localities where this pest occurs, requires postentry quarantine under Part 319.37.

1. Examine bolls for evidence of external feeding, particularly under the calyx. External signs are not always evident.
2. Cut open bolls and look for larvae. Kill larvae in boiling water or KAAD and preserve in 70 to 80 percent alcohol.
3. Traps baited with Z,Z-7,11-hexadecadienyl ethanoate (cited as Z,Z-7,11-hexadecadienyl acetate by Rothschild (1975)) proved to be an effective attractant for males in Queensland. The most effective trap for pink-spotted bollworm is unknown, but Delta traps were the most effective of four pheromone traps tested for pink bollworm (Foster, Staten, Miller 1977). Remove adults and preserve in 70 to 80 percent alcohol.
4. Ultraviolet light appears to be an ineffective attractant for adults and an inefficient method as many nontarget species will be collected. If suspected specimens are caught, they should be pinned and labeled for subsequent identification.

Biology

In Queensland, four generations may occur during the growing season. Larvae, and possibly adults, overwinter. Eggs may be laid singly or in clusters on any exposed plant surface. First and second instar larvae browse on plant tissue on one surface, often making small holes or depressions. Third and fourth instar larvae usually enter bolls and eventually feed on the seeds. Pupation takes place in a cocoon in the bolls or outside the boll but within the involucre. Natural dispersion is in the adult stage. Holdaway (1926) stated that larvae could be moved about with the seeds. Sloan (1946) indicated, however, that the larvae normally do not enter a diapause and are not moved about with seed. Sources of infestation between seasons are standover and ratooning crops and wild hosts (Sabine 1969b).

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